

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
Land Division
Honolulu, Hawaii 96813

April 28, 2006

Board of Land and Natural Resources
State of Hawaii
Honolulu, Hawaii

PSF No.: 05OD-068

Oahu

Issuance of a 2nd Right-of-Entry Permit to Natural Systems, Inc., for Insitu
Phytoremediation of the Ala Wai Canal Purposes, Waikiki, Honolulu, Oahu, Tax
Map Key: (1) 2-7-036:002-B (Ala Wai Canal).

APPLICANT:

Natural Systems, Inc., a corporation, whose business and mailing address is 31 Coelho
Way, Honolulu, Hawaii 96817.

LEGAL REFERENCE:

Sections 171-55, Hawaii Revised Statutes, as amended.

LOCATION:

Portion of Government lands situated at Waikiki, Honolulu, Oahu, Tax Map Key: (1) 2-7-
036:002-B, as shown on the attached map labeled Exhibit A.

AREA:

16,000 Square feet, more or less.

ZONING:

State Land Use District: Urban
County of Honolulu CZO: Park/Open

TRUST LAND STATUS:

Section 5(b) lands of the Hawaii Admission Act

DHHL 30% entitlement lands pursuant to the Hawaii State Constitution:

YES ____ NO X

CURRENT USE STATUS:

Encumbered by Land Office Deed No. S-28073, Kyo-Ya Company, Inc., Grantee, for perpetual waterline easement purposes.

Previously encumbered by a one (1) year Right-of-Entry Permit to Applicant for Insitu Phytoremediation of the Ala Wai Canal Purposes, commencing on April 27, 2005 and expiring on April 27, 2006.

CHARACTER OF USE:

Insitu Phytoremediation of the Ala Wai Canal Purposes.

TERM OF RIGHT-OF-ENTRY:

One (1) year.

CONSIDERATION:

Gratis. (See Remarks)

CHAPTER 343 - ENVIRONMENTAL ASSESSMENT:

In accordance with the "Division of Land Management's Environmental Impact Statement Exemption List", approved by the Environmental Council and dated April 28, 1986, the subject request is exempt from the preparation of an environmental assessment pursuant to Exemption Class No. 5, Item No. 1 that states "Permission to enter State lands for the purpose of basic data collection, research, experimental management and resources evaluation activities such as archaeological survey, topographic survey, test borings for soil test, ground cover survey inspection of property for appraisal and development feasibility study purposes."

DCCA VERIFICATION:

Place of business registration confirmed:	YES <u>X</u>	NO <u> </u>
Registered business name confirmed:	YES <u>X</u>	NO <u> </u>
Applicant in good standing confirmed:	YES <u>X</u>	NO <u> </u>

APPLICANT REQUIREMENTS:

Applicant shall be required to:

- 1) Consult with Kyo-Ya Company, Inc. (Princess Kaiulani Hotel), as necessary,

regarding their waterline easement located in or near the subject area;

- 2) Refrain from any commercial activity in connection with the project;
- 3) Remove any and all material relating to this Insitu Phytoremediation study, and restore the right-of-entry area to the satisfaction of the Department of Land and Natural Resources at the expiration of this right-of-entry;
- 4) Work with all canoe clubs that use the Ala Wai Canal and insure that the project does not interfere with their activities; and
- 5) Provide a comprehensive report on the results of the research to the Department of Land and Natural Resources.

REMARKS:

For the past year, the Applicant has been utilizing a portion of the Ala Wai Canal for its Insitu Phytoremediation study under a one (1) year right-of-entry approved by the Land Board, at its meeting on April 22, 2005, under Item D-12 (copy enclosed as Exhibit "A"). The study involved working with fresh water bioremediation technologies to improve and maintain the water quality of coastal and saline waters to protect public health and the environment. The phyto agent used in this particular study was the native Akulikuli plant, which according to the Applicant, has yielded some encouraging results, although its overall impact on the canal waters are not conclusive. This has motivated the Applicant to continue their research in the canal for another year.

As a condition of their previous right-of-entry, the Applicant was required to provide a report of the research results to the Department of Land and Natural Resources. A brief summary of their study is provided herein as Exhibit "B", which is expected to be followed by a more formal report on the Applicant's research over the last year.

In light of the recent emergency release of approximately 48 million gallons of raw sewage into the Ala Wai Canal by the City and County, and the potential long-term effects it may have on our waters, staff believes it is in the State's best interest to allow the Applicant to continue its research.

Staff has not received any complaint from the general public regarding the Applicant's use of the canal during the last year. A complaint from the general public is even less likely now that the canal is generally considered off-limits by most of its previous users. Staff expects this trend to continue for at least the next few months.

The Applicant is therefore requesting another one (1) year right-of-entry under the terms and conditions provided above, which were previously approved by the Land Board in

2005, including the waiver of the right-of-entry fee, based on the permit's use for research, and the absence of any monetary profit for the Applicant.

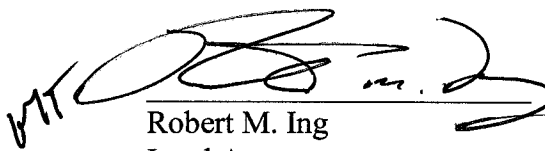
Staff also anticipates the Applicant may request other right-of-entries to extend their research term, or include other areas of the canal in their study. Staff is therefore recommending the Land Board's authorization for the Chairperson to issue future right-of-entries to the Applicant for its use of the Ala Wai Canal.

RECOMMENDATION:

That the Board, subject to the Applicant fulfilling the Applicant Requirements above:

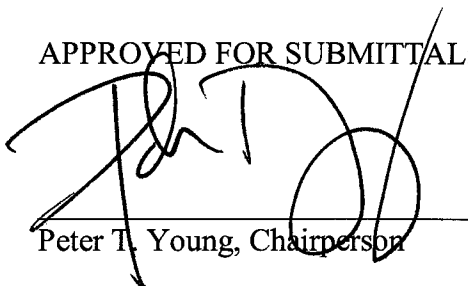
1. Authorize the issuance of a one (1) year right-of-entry permit to Natural Systems, Inc., covering the subject area under the terms and conditions cited above, which are by this reference incorporated herein and further subject to the following:
 - A. The standard terms and conditions of the most current right-of-entry permit form, as may be amended from time to time; and
 - B. Such other terms and conditions as may be prescribed by the Chairperson to best serve the interests of the State.
2. Waive the right-of-entry fee for Natural Systems, Inc.
3. Authorize the Chairperson to issue future right-of-entries to the Applicant in relation to its Insitu Phytoremediation studies in the Ala Wai Canal.

Respectfully Submitted,



Robert M. Ing
Land Agent

APPROVED FOR SUBMITTAL:



Peter T. Young, Chairperson

0040
AMENDED

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
Land Division
Honolulu, Hawaii 96813

April 22, 2005

Board of Land and Natural Resources
State of Hawaii
Honolulu, Hawaii

PSF No.: 05OD-068

Oahu

Issuance of Right-of-Entry Permit to Natural Systems, Inc.,
for Insitu Phytoremediation of the Ala Wai Canal Purposes,
Waikiki, Honolulu, Oahu, Tax Map Key: (1) 2-7-036:002-B (Ala
Wai Canal).

APPLICANT:

Natural Systems, Inc., a corporation, whose business and mailing
address is 31 Coelho Way, Honolulu, Hawaii 96817.

LEGAL REFERENCE:

Sections 171-55, Hawaii Revised Statutes, as amended.

LOCATION:

Portion of Government lands situated at Waikiki, Honolulu, Oahu,
Tax Map Key: (1) 2-7-036:002-B, as shown on the attached map
labeled Exhibit A.

AREA:

16,000 Square Feet, more or less.

ZONING:

State Land Use District: Urban
County of Honolulu CZO: Park/Open

TRUST LAND STATUS:

Section 5(b) lands of the Hawaii Admission Act

DHHL 30% entitlement lands pursuant to the Hawaii State
Constitution: YES _____ NO X

CURRENT USE STATUS:

Encumbered by Land Office Deed No. S-28073, Kyo-Ya Company, -Inc.,
Grantee, for perpetual waterline easement purposes.

As Amended
**APPROVED BY THE BOARD OF
LAND AND NATURAL RESOURCES
AT ITS MEETING HELD ON *MO***

April 22, 2005

EXHIBIT "A"

ITEM D-12

CHARACTER OF USE:

Insitu Phytoremediation of the Ala Wai Canal Purposes.

TERM OF RIGHT-OF-ENTRY:

One (1) year.

CONSIDERATION:

Gratis. (See Remarks)

CHAPTER 343 - ENVIRONMENTAL ASSESSMENT:

In accordance with the "Division of Land Management's Environmental Impact Statement Exemption List", approved by the Environmental Council and dated April 28, 1986, the subject request is exempt from the preparation of an environmental assessment pursuant to Exemption Class No. 5, Item No. 1 that states "Permission to enter State lands for the purpose of basic data collection, research, experimental management and resources evaluation activities such as archaeological survey, topographic survey, test borings for soil test, ground cover survey inspection of property for appraisal and development feasibility study purposes."

DCCA VERIFICATION:

Place of business registration confirmed:	YES	<u>X</u>	NO	<u> </u>
Registered business name confirmed:	YES	<u>X</u>	NO	<u> </u>
Applicant in good standing confirmed:	YES	<u>X</u>	NO	<u> </u>

APPLICANT REQUIREMENTS:

Applicant shall be required to:

- 1) Consult with Kyo-Ya Company, Inc. (Princess Kaiulani Hotel) regarding their waterline easement involving the subject area.

REMARKS:

The Applicant works with fresh water bioremediation technologies to improve and maintain the water quality of coastal and saline waters to protect public health and the environment. The Applicant hopes to eventually work with the Department of Health to mitigate coastal waters, harbors and drainages that exceed the State's Total Maximum Daily Load (TMDL) of nutrients. Their use of the native Akulikuli plant has been successful in lab tests and small pilot projects, encouraging larger scale research. For this purpose, the Applicant is requesting to use a portion of the Ala Wai Canal, abutting the golf course.

The Applicant intends to place the Akulikuli plant on the canal water using a long line of hydroponic rafts, or floating phyto remediation platforms (FPP's) for a length of approximately 3,396 feet along the mauka side of the canal. A second line of FPP's measuring approximately 50 feet will be placed along the East bank of the canal, near the Kapahulu Library (Shown on the attached map labeled Exhibit A). The line of FPP's will be situated within 20 feet of the canal banks and will not hinder the regular kayak and canoe paddling in the area. A photo of a pilot project held in a nearby drainage canal is shown as Exhibit B. The difference is that only one row of Akulikuli plants will be used. Both conventional and mushroom-type boat anchors spaced every 10 or so feet will be used to stabilize the FPP's. Photos of the anchors are shown in Exhibit C.

An aeration system consisting of hoses and 1.5 Horse Power blowers will be used to circulate water under the plants. The blowers will be installed on the banks of the canal and encased in 18"H x 24"x 24" housings for protection and sound reduction. The approximate location of each blower is shown on Exhibit A. Hoses from each blower will be connected to the FPP lines and run the length of the raft system.

The project's goal is to reduce the levels of nitrogen, phosphorus, algae and pathenogenic bacteria in the canal waters to improve the water clarity and reduce odor. The project will last for a period of one (1) year, in which the Applicant will run tests, take samples, monitor and maintain the system on a regular basis.

A portion of the subject area is encumbered by a waterline serving the Princess Kaiulani Hotel. A non-exclusive easement for said waterline is pending execution. The Applicant will be required to consult with the "grantees" regarding the existing waterline.

Staff believes the Land Board 's approval is necessary for this right-of-entry because of the visual impact it will have on the canal. Staff also feels the community should have an opportunity to comment. In addition, it is unclear whether the Division of Boating and Ocean Recreation has jurisdiction over the canal.

The Applicant has already received letters of support from private groups, various government agencies and a State Senator for the project (Some of which is provided as Exhibit D).

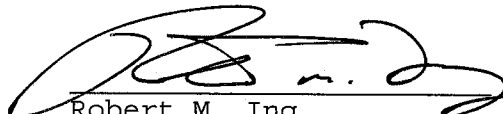
Based on the research involved, the absence of monetary profit for the Applicant, and the potential benefit to the State, staff is requesting the Land Board to waive the right-of-entry fee.

RECOMMENDATION:

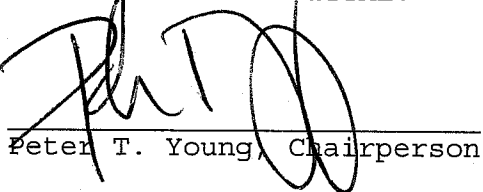
That the Board, subject to the Applicant fulfilling the Applicant Requirements above:

1. Authorize the issuance of a one (1) year right-of-entry permit to Natural Systems, Inc. covering the subject area under the terms and conditions cited above, which are by this reference incorporated herein and further subject to the following:
 - A. The standard terms and conditions of the most current right-of-entry permit form, as may be amended from time to time; and
 - B. Such other terms and conditions as may be prescribed by the Chairperson to best serve the interests of the State.
2. Waive the right-of-entry fee for Natural Systems, Inc.

Respectfully Submitted,

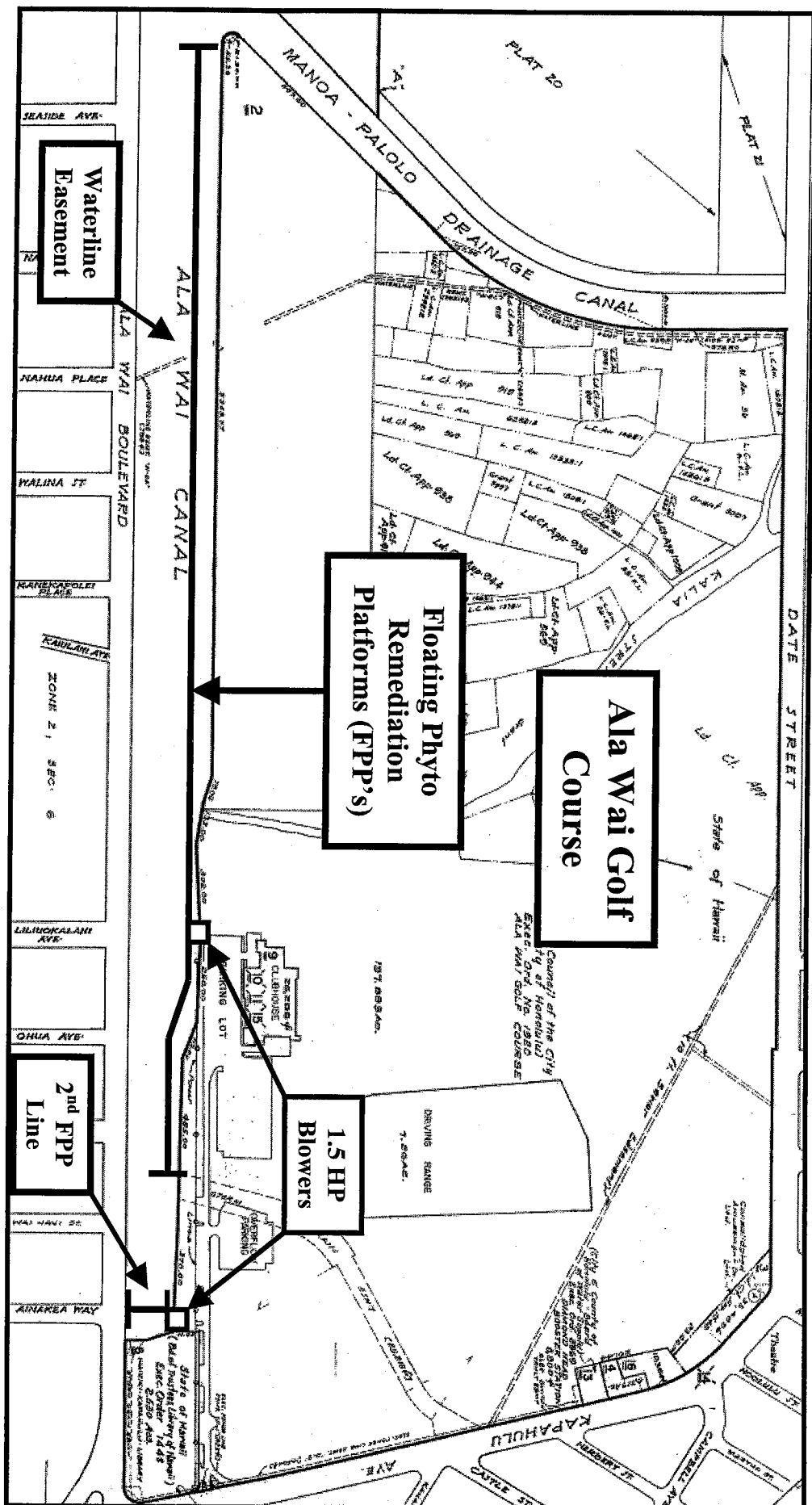

Robert M. Ing
Land Agent

APPROVED FOR SUBMITTAL:


Peter T. Young, Chairperson

Approved as amended. The Board amended the submittal by adding the following conditions to the recommendation section:

3. There shall be no commercial activity in connection with the project
4. The permittee shall be responsible for removal of all material and restoration of the site.
5. The permittee shall work with all canoe clubs that use the Ala Wai Canal and insure that the project does not interfere with their activities.
6. A report of the results of research shall be provided to the Department of Land and Natural Resources.

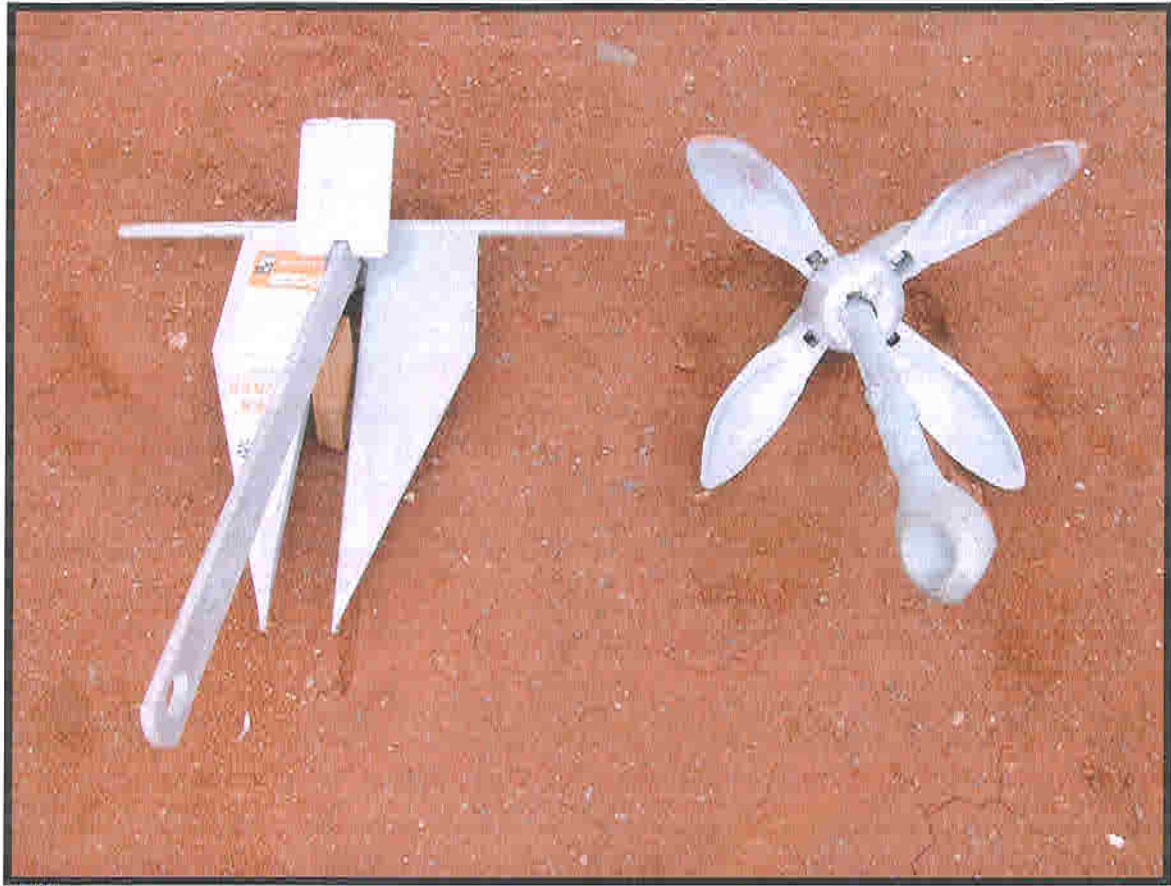


Insitu Phyto Remediation of the Ala Wai Canal TMK: (1) 2-7-036: 002-B Portion

*Note-1.5 HP Blowers to be placed within the canal boundaries.



EXHIBIT "B"



Conventional-type anchors



Mushroom Anchor

EXHIBIT "C"

HAWAIIAN CANOE RACING ASSOCIATION

November 1, 2004

D. Chad Durkin, Project Manager
Natural Systems, Inc.
2040 Bachelot St.
Honolulu HI 96817

Dear Mr. Durkin:

The Hawaiian Canoe Racing Association enjoyed the very interesting and informative presentation given by Dr. Wen Hau Sun at our board meeting on October 16, 2004. Our interest centered on the goal of the project: improve water quality in the Ala Wai Canal with minimum impact to paddlers and others who use the canal for recreation.

The presentation generated interesting questions, all of which were answered very satisfactorily by Dr. Sun. His graphics were outstanding and included many interesting pictures and statistics that further explained what the project was all about. We were also pleased to know that this has been done in other areas in Hawaii with satisfactory results.

HCRA supports the work of Natural Systems, Inc. in this effort. We appreciate the time taken by Dr. Sun to meet with our organization.

Sincerely,



Shelly Gilman, Secretary
Hawaiian Canoe Racing Association
12A Kailua Rd.
Kailua HI 96734

EXHIBIT D



IOLANI SCHOOL

September 11, 2003

OFFICE OF
THE HEADMASTER

Biosystems Technology Program Grant Application
Project Title: *In situ* phytoremediation of Ala Wai Canal: A model for Best Management Practice of Coastal Urban Watersheds

Dr. Wenhao Sun, Vice President and Chief Scientist of Marine AgreTech, Inc., has asked me to write a letter of support for their project. I am glad to do so.

Dr. Sun approached me a few months ago to get my thoughts on the value of his proposed work and whether or not we would consider involving our students and teachers in the project. I am sometimes leery of becoming involved with research of this type, knowing the heavy demands on time which our teachers and students encounter during the school year. The more I heard of the study, however, the more I looked upon it as a meaningful educational opportunity for our school community.

The portion of the Manoa and Palolo streams that is proposed for the study is adjacent to our campus. Our proximity to this area, and our frequent use of the Ala Wai Canal for kayaking and canoe paddling activities, has provided lots of exposure to the pollution which exists. Students have, in the past, complained of skin irritations when coming into contact with the water, and the odor that sometimes permeates the area is a sure sign of decay. We would welcome efforts to improve the quality of water that exists in the area, especially when such methods involve natural and environmentally sound processes.

Teachers and students would have the added benefit of viewing, first hand, an experimental approach to solving ecological problems. Dr. Sun has kindly offered to describe what is happening to our students and teachers, and to find ways in which we could become actively and meaningfully involved. This real-to-life laboratory would be easily accessible to us and could have educational value for students in Kindergarten through Grade 12.

I applaud Dr. Sun's efforts to bring this project to fruition. We support the purpose of the study and also view the activity as having value for our school community.

Yours truly,

A handwritten signature in cursive script that reads "Val T. Iwashita".

Val T. Iwashita, Ed.D.



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440

20 DEC 2004

Regulatory Branch

LETTER OF PERMISSION

File No. POH-2004-1113

Mr. Jan Dill
Natural Systems, Inc.
31 Coelho Way
Honolulu, Hawaii 96817

Dear Mr. Dill:

This responds to your application for Department of the Army (DA) authorization to install temporary, floating, planted rafts (floating phytoremediation platforms, or FPPs) along the inland (*mauka*) bank and at the Kapahulu end of the Ala Wai Canal; in the lower Manoa-Palolo Drainage Canal; and in lower Makiki Stream, Oahu. The purpose of the proposed activity is to demonstrate the feasibility of reducing nutrient pollution in the Ala Wai Canal by use of the FPPs. The project is described in your DA application dated June 14, 2004, as amended by additional information submitted on August 5, October 6, and December 10, 2004. The project would not involve any discharge of dredged or fill material into, nor would it require any excavation in, the navigable waters of the United States.

I have determined that the activity involves work or structures in or affecting the course, condition, location or capacity of navigable waters of the United States and that it may be authorized by a Letter of Permission pursuant to Section 10 of the Rivers and Harbors Act of March 3, 1899 (33 U.S.C. 403). I have coordinated your request with interested agencies and hereby approve it. This authorization does not relieve you of the responsibility to obtain other authorizations or approvals that may be required by other Federal agencies, the State of Hawaii, or the City and County of Honolulu.

All work shall be performed in accordance with the project documentation you provided, including your described measures to mitigate potential impacts on the aquatic environment. In order for you to utilize this authorization, your activity must comply with the enclosed General and Special Conditions and with the State Water Quality Standards administered by the Department of Health. It must also comply with conditions of the Hawaii Coastal Zone Management (CZM) consistency concurrence issued to you by the State of Hawaii Office of Planning on November 5, 2004.

Enclosed is a two-page form, Notification of Administrative Appeal Options and Process and Request for Appeal, which you need not complete or return to us unless you do not accept the enclosed permit conditions. This permit will expire two years from the date of this letter.

A copy of this letter (without enclosures) has been sent to the Protected Resources Division of the National Marine Fisheries Service; U.S. Fish and Wildlife Service; State of Hawaii Office of Planning, Coastal Zone Management Program; State of Hawaii Department of Health, Clean Water Branch; State of Hawaii Historic Preservation Division; State of Hawaii Commission on Water Resource Management; State of Hawaii Division of Aquatic Resources; State of Hawaii Office of Hawaiian Affairs; and the Hawaiian Canoe Racing Association.

If you have questions regarding this authorization, please contact Mr. Peter Galloway of my Regulatory staff at 438-8416 (FAX 438-4060). Written inquiries should cite File No. POH-2004-1113 (replaces 200400379) and should be sent to: Regulatory Branch (CEPOH-EC-R/P. Galloway); U.S. Army Engineer District, Honolulu; Building 230; Fort Shafter, Hawaii 96858-5440.

Thank you for working with the U.S. Army Corps of Engineers to protect the aquatic resources of Hawaii.

BY AUTHORITY OF THE SECRETARY OF THE ARMY:



David E. Anderson
Lieutenant Colonel, U.S. Army
District Engineer

12/20/2004
DATE

Enclosures

LINDA LINGLE
GOVERNOR OF HAWAII



PETER T. YOUNG
CHAIRPERSON

MEREDITH J. CHING
CLAYTON W. DELA CRUZ
JAMES A. FRAZIER
CHIYOME L. FUKINO, M.D.
LAWRENCE H. MIKE, M.D., J.D.
STEPHANIE A. WHALEN

YVONNE Y. IZU
DEPUTY DIRECTOR



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 821
HONOLULU, HAWAII 96809
JUL 21 2004

Mr. Jan Dill, President
Natural Systems, Inc
31 Coelho Way
Honolulu, Hawaii 96781

Dear Mr. Dill:

Thank you for your June 24, 2004 letter requesting whether a proposed experimental phyto-remediation project for the Ala Wai Canal would require a stream channel alteration permit pursuant to Hawaii Revised Statutes §174C-71.

After reviewing your letter and attachments we have determined that a stream channel alteration permit will not be required for this experimental phyto-remediation project. We understand that the proposed project would be temporary (sixteen months) and two sites will be affected including the Kapahulu end of the Ala Wai Canal and the lower reach of Makiki Stream. The floating platforms will be moored in place by anchors and there will not be any structures built on the Ala Wai Canal bed or banks. We also understand that at the end of the sixteen month period, all materials will be removed at the State's request.

Although we are not requiring a stream channel alteration permit for the proposed project we recommend that your organization work with users of the Ala Wai Canal (canoe clubs, anglers, etc) as well as with the Division of Aquatic Resources and the Office of Conservation and Coastal Lands to address any concerns they may have.

Also, please be advised that this project may require other agency approvals regarding water quality, wetlands, grading, grubbing, stockpiling, and floodway and drainageway maintenance. This letter does not constitute or imply compliance with other Federal, state or county rules.

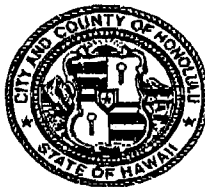
Any future proposal for phyto-remediation beyond the sixteen month period should be discussed with our office to determine whether a stream channel alteration permit will be required. Thank you for your inquiry. If you have any questions regarding this letter, please call David Higa at 587-0249.

Sincerely,

A handwritten signature in black ink, appearing to read "Yvonne Y. Izu".
YVONNE Y. IZU
Deputy Director

DH:sd

c. Division of Aquatic Resources
Office of Conservation and Coastal Lands

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY AND COUNTY OF HONOLULU1000 ULUOHIA STREET, SUITE 308 KAPOLEI, HAWAII 96707
PHONE: (808) 692-5159 FAX: (808) 692-5113 Website: www.co.honolulu.hi.usJEREMY HARRIS
MayorFRANK J. DOYLE, P.E.
DirectorTIMOTHY A. HOUGHTON
Deputy Director

ENV 03-049

September 10, 2003

Dr. Wenhao Sun, Vice President
Marine AgriTech, Inc.
1188 Bishop Street, #2003
Honolulu, Hawaii 96813

Dear Dr. Sun:

Subject: In Situ Phytoremediation of Ala Wai Canal

We express our support in the project entitled, "In Situ Phytoremediation of Ala Wai Canal." We commend Dr. Wenhao Sun and his partners for their vision of providing innovative technologies to be applied in Oahu's waterways and tributaries in an attempt to address the ongoing issue of polluted runoff. As the City is continually challenged to maintain and/or improve the quality of our environment, we are always looking for new ways to achieve such goals. Dr. Sun has shown us that his phytoremediation technology is a viable method of treating such urban runoff and improving the water quality in our streams and waterways and should be given the opportunity to demonstrate it. Currently, we are working in partnership with Dr. Sun to determine the effectiveness of his phytoremediation technology in the Salt Lake area and are eagerly awaiting the results of his findings in that particular study.

If you have any questions, please contact Gerald Takayesu of the Storm Water Quality Branch, Division of Environmental Quality at 692-5579.

Sincerely,

A handwritten signature in black ink, appearing to read "Frank J. Doyle".
FRANK J. DOYLE, P.E.
Director

LAWA LAKI
HONOLULU, HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
HONOLULU, HAWAII 96809

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

DAVID YIM LAU
DEPUTY DIRECTOR - WATER

ADULT RESOURCES
FOOD AND SOIL RESOURCES
BUREAU OF CONSERVATION
COMMISSION ON NATURAL RESOURCES MANAGEMENT
CONSERVATION AND COUNCIL LAND
CONSERVATION AND RESOURCES DEPARTMENT
HONOLULU, HAWAII 96809
STATE POWER

SEP 12 2000

Dr. Wenhao Sun, Ph.D.
Vice President & Chief Scientist
Marine AgriTech, Inc.
1188 Bishop Street, #2003
Honolulu, Hawaii 96813

Dear Dr. Sun:

**Biosystems Technology Program Grant Application: *In situ*
Phytoremediation of Ala Wai Canal: A model for Best
Management Practice of Coastal Urban Watersheds**

We support the concept of installing floating phytoremediation platforms cultivated with akulikuli plants and/or other native salt-tolerant plants to reduce nutrient, suspended particles, and urban contaminants from the Ala Wai Canal Waters. We also support the installation of an air diffusion system to increase dissolved oxygen levels and provide vertical mixing of the water column.

We believe that good water quality in the Ala Wai Canal is essential for a diverse and healthy aquatic ecosystem. To improve the aquatic ecosystem in the Ala Wai Canal and its tributary streams, and to mitigate flooding, we have undertaken a joint study, known as the Ala Wai Watershed Feasibility Study with the U.S. Army Corps of Engineers. We are presently evaluating a wide range of alternatives to meet the above study objectives.

Should you be successful in obtaining the grant, please contact our Department to obtain the necessary permits and/or approvals to proceed with the project. If you have any questions, please call Mr. Eric Hirano, Chief Engineer at 587-0230.

Sincerely,


Peter T. Young
Chairperson

ROBERT BUNDA
PRESIDENT

JENNA MERCADO KIM
VICE PRESIDENT

ALLEN HANABUSA
MAJORITY LEADER

AL KAWAMOTO
MAJORITY FLOOR LEADER

IAN S. TSUTSUI
MAJORITY CAUCUS LEADER

RED HEMMING
MINORITY LEADER

BOB MOGUE
MINORITY FLOOR LEADER

AUL WHALEN
MINORITY POLICY LEADER

The Senate
The Twenty-Second Legislature
of the
State of Hawaii

STATE CAPITOL
HONOLULU, HAWAII 96813



September 12, 2003

FIRST DISTRICT
LORRAINE R. INOUE

SECOND DISTRICT
RUSSELL B. KOKUBUN

THIRD DISTRICT
PAUL WHALEN

FOURTH DISTRICT
IAN S. TSUTSUI

FIFTH DISTRICT
RODOLPH W. BAKER

SIXTH DISTRICT
J. KALANI ENGLISH

SEVENTH DISTRICT
GARY L. HOOPER

EIGHTH DISTRICT
SAM GLOM

NINTH DISTRICT
LEO HARA, JR.

TENTH DISTRICT
BRIANT TANGUCH

ELEVENTH DISTRICT
CAROL FUKUNAGA

TWELFTH DISTRICT
GORDON TRIMBLE

THIRTEENTH DISTRICT
SUZANNE CHUN OAKLAND

FOURTEENTH DISTRICT
JENNA MERCADO KIM

FIFTEENTH DISTRICT
NORMAN SAKAMOTO

SIXTEENTH DISTRICT
DAVID ICE

SEVENTEENTH DISTRICT
RON MENOR

EIGHTEENTH DISTRICT
AL KAWAMOTO

NINETEENTH DISTRICT
BRYAN KANNO

TWENTIETH DISTRICT
WILLOU D. ESPERO

TWENTY-FIRST DISTRICT
COLLEEN MANAOGA

TWENTY-SECOND DISTRICT
ROBERT BUNDA

TWENTY-THIRD DISTRICT
MELODIE WILLIAMS ADUJA

TWENTY-FOURTH DISTRICT
BOB MOGUE

TWENTY-FIFTH DISTRICT
FRED HEMMING

CHIEF CLERK
PAUL F. KAWAGUCHI

Wenhao H. Sun, Ph.D.
Assistant Researcher
Department of Molecular Biosciences and Bioengineering
College of Tropical Agriculture and Human Resources
University of Hawaii
Agricultural Science Building 218
1955 East-West Road
Honolulu, Hawaii 96822

Dear Dr. Sun:

Please accept this letter as an expression of my support for your Biosystems Technology Program grant proposal entitled "In Situ Phytoremediation of the Ala Wai Canal: A Model for Best Management Practice of Coastal Urban Watersheds".

As you are aware, I have been a longtime supporter of a bioremedial approach to improving the water quality in the Ala Wai Canal. I support your proposal because I believe that the project will help the State to develop valuable information and a better understanding of the use of bioremedial processes. The project will also provide economic benefits to the State through the creation of employment opportunities, commercialization of marine phytoremediation technology, and development of the State's nutraceutical industry. Additionally, the project will enhance marine environmental research in Hawaii and the Pacific Region.

If I may be of further assistance, please do not hesitate to contact me.

Sincerely,

Suzanne Chun Oakland

Suzanne Chun Oakland
Senator, 13th District

Report to the State of Hawaii DLNR on the Operations of the Ala Wai phytoremediation project.

Attn: Peter Young, Robert Ing, Mike Kido

The Ala Wai Canal is designated as a water quality limited segment (WQLS) water body by the State DOH. The water quality in the canal puts at risk public health and the environmental health of the community of Waikiki, as well as the economic well being of the State of Hawaii. This project seeks to remediate the ~~organic~~-nutrient pollution in the stream channel through *in situ* floating phyto-remediation platforms (FPP™).

The ability of plants and their associated rhizo-ecology to remove pollutants in water has been demonstrated consistently since the 1950's. The goal of this project is to utilize this technology in the Ala Wai Canal to reduce the levels of nitrogen, phosphorus, algae and pathogenic bacteria in the stream waters.

Through water quality monitoring conducted by Natural Systems Inc., Marine Agritech staff, and third party laboratory analyses, changes in the water quality at several sites in the canal was observed. Levels of dissolved oxygen, turbidity, salinity, temperature, nitrogen, and phosphorus have been recorded at eleven points throughout the project deployment and in upstream non planted areas. Results of this study are inconclusive as to the overall impact of the rafts on the canal. However, data has shown the presence and activity of the marine biofilms as well as the Akulikuli plants ability uptake and remove primary nutrients, nitrogen and phosphorus and some heavy metals, from the canal.

The educational program has continued to inform residents and users of the canal as well as school students and the community at large through media co-operation. The content based educational program draws on curriculum developed to promote an interdependent view of the many distinct and neighboring ecologies throughout the watershed; from the tops of mountains down into the streams and sea.

Currently three thousand feet of Akulikuli planted FPP are installed in the canal. A two thousand foot aeration system is powered at two points, at the Kapahulu Library for the Deaf and Blind and at the City and County Ala Wai golf course. Floating trash screenbooms at two sites collect floating debris at the storm drain exits. The system filters approximately 1.7 million gallons per day of the Ala Wai's water. Native Hawaiian herons and ducks have been observed continuously using the raft as a feeding and habitat platform.

EXHIBIT "B"